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## Claims

1. A purified thermostable DNA polymerase obtainable from *Thermococcus gorgonarius*  
5 which catalyses the template directed polymerisation of DNA, possesses 3'-5'-exonuclease (proofreading) activity and is characterised by at least a two-fold greater replication fidelity than DNA polymerase obtainable from *Pyrococcus furiosus*.
2. A purified thermostable DNA polymerase according to claim 1 which retains about 90 % of its activity after incubation for two hours at about 95°C in the presence of a stabilizer.
- 10 3. The polymerase as claimed in any one of claims 1 - 2, wherein said polymerase has an apparent molecular weight between about 92 000 to 96 000 daltons.
4. The polymerase as claimed in any one of claims 1 - 3, wherein said polymerase is obtainable from E.coli.
5. A stabilized composition consisting of a polymerase as claimed in any one of claims  
15 1 - 4 and a stabilizer.
6. The composition according to claims 1 - 5, wherein said stabilizer is a non-ionic detergent.
7. The composition according to claim 1 - 6, wherein Thesit and/or Nonident P 40 serve as stabilizer.
8. An isolated DNA sequence coding for the polymerase according to any one of claims 1 - 7  
20 obtainable from *Thermococcus gorgonarius*.
9. An isolated DNA sequence coding for the polymerase as claimed in claim 8 contained within the plasmid pBTac2Tgo.
10. An isolated DNA sequence of claim 9 contained within an approximately 2.3 kB EcoRI/PstI restriction fragment of plasmid pBTac2Tgo.
- 25 11. An isolated DNA sequence represented by the formula shown in SEQ ID No. 6.
12. A vector containing the isolated DNA sequence as claimed in any one of claims 8 - 11.
13. The vector of claim 12, wherein such vector is plasmid pBTac2Tgo.
14. The vector according to claims 12 and 13 providing some or all of the following features:  
(1) promoters or sites of initiation of transcription

- (2) operators which could be used to turn gene expression on or off
- (3) ribosome binding sites for improved translation
- (4) transcription or translation termination sites.

15. A microbial host transformed with the vector of claims 12 - 14.

5 16. A microbial host according to claim 15 wherein said host is from *E. coli* LE 392 pUBS 520 and designated *E. coli* pBtac2Tgo.

17. A process for the preparation of DNA polymerase according to any one of claims 1 - 7 comprising the steps:

- (a) culturing the natural strain *Thermococcus gorgonarius*
  - 10 (b) suspending the cells of the natural cells in buffer
  - (c) disrupting the cells
  - (d) purifying the DNA polymerase by several chromatographic steps.
18. A process for the preparation of DNA polymerase according to any one of claims 1 - 7 comprising growing a microbial host strain according to claims 15 or 16 and purifying the  
15 DNA polymerase therefrom.
19. A process for amplifying DNA, characterized in that a thermostable DNA polymerase according to any one of claims 1 - 7 is used.
20. A process for DNA sequencing or DNA labelling, characterized in that a thermostable DNA polymerase according to any of the claims 1 - 7 is used wherein the 3'-5'  
20 exonuclease activity of said DNA polymerase is inactivated.
21. A process for second cDNA cloning and DNA sequencing, characterized in that a thermostable DNA polymerase according to any one of claims 1 - 7 is used.
22. A process for DNA sequencing, characterized in that a thermostable DNA polymerase according to any one of claims 1 - 7 is used.